Current Pain and the Visual Analogue Scale as a Predictor of Quality of Life in Individuals with Osteoporosis

C.J.Heales (1), K.M.Knapp (1), A.E.B.Moore (2), G.M.Blake (2), R. Swaminathan (2), I.Fogelman (2).

(1) University of Exeter, UK
(2) King's College School of Medicine, UK.

Introduction

Osteoporosis is a chronic metabolic bone disease characterized by a reduction in bone mass, degraded bone microarchitecture and increased risk of fracture [1]. The morbidity associated with osteoporosis is regarded as being a consequence of fracture [2]. Vertebral fractures in particular are associated with increased mortality, increased back-pain and reduced mobility and function [1,3,4].

The consequences of vertebral fracture in an osteoporotic individual is likely to be a reduced Health-related quality of life (HRQOL) [5]. HRQOL encompasses the spectrum of physical, mental and social well-being [5] and economic, political, cultural and spiritual outlook [6]. The QUALEFFO-41 (questionnaire of the European Foundation for Osteoporosis) is a commonly used tool for the assessment of HRQOL in osteoporotic individuals.

Increased back-pain is a feature associated with known vertebral fractures in osteoporotic individuals. Visual analogue scales (VAS) are quantitative tools that measure an individual's perception of pain. The use of such scales has been further validated by the findings of fMRI measurements of the brain's response to pain [7].

Aim

To investigate the use of a VAS Score as a measure of current low back-pain and as a predictor for quality of life.

Method

80 patients (66 female, 14 male) with osteoporosis and / or current or recent (within the last 6 months) back-pain were recruited. These individuals had already been referred for bone mineral density (BMD) measurements of the lumbar spine and hip (Hologic Delphi, Bedford USA).

Subjects were invited to undergo instant vertebral assessment (IVA) in addition to DXA and were asked to complete a QUALEFFO-41 questionnaire (reduction in HRQOL increasing with increased score), VAS scale to indicate current back-pain (1—10 with 10 being the most severe pain) and a fracture history questionnaire (St Thomas' hospital).

Study Population

Population Characteristics	Whole Group Mean (SD)
N	80 (66 female, 14 male)
Mean Age (y)	62.6 (15.2)
Mean Height (cm)	161.4 (8.9)
Mean Weight (kg)	63.7 (15.4)
Mean BMI (kg/m^2)	24.4 (5.2)
Lumbar Spine T Score	-2.1 (1.5)
Neck of Femur T Score	-2.0 (1.0)
Total Hip T Score	-1.7 (1.1)
VAS score of current back-pain	2.5 (3.1)
Total QUALEFFO-41 score	29.6 (18.0)

Data Analysis

Data analysis was undertaken using a MS-Excel data analysis package, the T -test for data with unequal variance and a 95% confidence interval.

Subjects were divided into two groups:

- Group 1: moderate to severe pain (VAS ≥ 5)
- Group 2: mild or no pain (VAS ≤ 4)

Characteristics	Group 1 Mean (SD)	Group 2 Mean (SD)
N	25	55
Mean Age (y)	69.0 (14.3)	59.6* (14.8)
Mean Height (cm)	158.9 (7.3)	162.5 (9.3)
Mean Weight (kg)	60.8 (10.4)	65.0 (17.1)
Mean BMI (kg/m2)	24.1 (3.8)	24.5 (5.7)
Lumbar Spine T Score	-2.0 (1.8)	-2.1(1.3)
Neck of Femur T Score	-2.3 (1.1)	-1.9 (0.9)
Total Hip T Score	-2.1 (1.1)	-1.5* (1.1)
VAS score of current back-pain	6.7 (1.6)	0.7 (1.3)
Total QUALEFFO-41 score	46.0 (13.3)	22.1* (14.6)

* p = < 0.05 when compared to group 1

When divided by VAS score, there were significant differences in HRQOL as measured using the QUALEFFO-41 both for individual domains and for overall quality of life.

Group	Qualeffo-41 Scores							
	Pain	*Physical Function*	*Jobs Around the House*	*Mobility*	*Leisure and Social Activities*	*General Health Perception*	*Mental Function*	Total Score
1	61.2	23.8	42.4	41.3	48.0	70.0	43.9	46.0
2	14.5*	9.9*	14.9*	14.3*	27.5*	42.3*	30.1*	22.2*

* p = < 0.05 when compared to group 1

Summary

There is a significant association between the degree of current back-pain and a reduction in health-related quality of life, in individuals with and without osteoporosis. Hence, a VAS score might be of use as an indicator of quality of life in a back-pain population.

References

[1] Leidic-Bruckner, G., H. Minne, C. Schlaich, et al., *Clinical grading of spinal osteoporosis: quality of life components and spinal deformity in women with chronic low back-pain and women with vertebral osteoporosis.* Journal of Bone and Mineral Research, 1997. **12**(4): p. 663.

[2] Bianchi, M., M. Orsini, S. Saraifoger, et al., *Quality of life in post-menopausal osteoporosis.* Health and Quality of Life Outcomes, 2005. **3**: p. 78

[3] Nevitt, M., B. Ettinger, D. Black, et al., *The association of radiographically detected vertebral fractures with back-pain and function: a prospective study.* American Journal of International Medicine, 1998. **128**: p. 793 - 800.

[4] Ross, P., B. Ettinger, J. Davis, et al., *Evaluation of adverse health outcomes associated with vertebral fractures.* Osteoporosis International, 1991. **1**: p. 134 - 140

[5] Lips, P. and N.v. Schoor, *Quality of life in patients with osteoporosis.* Osteoporosis International, 2005. **16**(5): p. 447 - 455.

[6] Randell, A., T. Nguyen, N. Bhalerao, et al., *Deterioration in quality of life following hip fracture: a prospective study.* Osteoporosis International, 2000. **11**: p. 460 - 466.

[7] Coghill, R.C., J.G. McHaffie and Y.-F. Yen, *Neural correlates of interindividual differences in the subjective experience of pain.* Proceedings of the National Academy of Sciences of the United States of America, 2003.100(14): p 8538- 8542

Funded by Guy's and St Thomas' Charitable Foundation